FUJI IMVAC™

Operator's Manual for BT-86

SPECIFICATIONS

Displacement:	5.2 cu. in. [86cc]
Horsepower:	7.0hp @ 8500 rpm
Ignition Style:	CDI Automatic Ignition Timing
RPM:	1100 – 8500 rpm
Fuel:	Gas/2-cycle engine oil
Weight w/Muffler:	7.1 lb [3.2kg]

FEATURES

Decompression Valves

The valves are located in the center part of each cylinder. Pressing this valve (one or both) before starting will decrease compression at starting. The valve on the firewall side may be operated by a servo for easier operation. Always use the valves when using an electric starter. The valves are closed automatically as the engine fires. For restarting, press the decompression valves again to open them.

ATM
AUTOMATIC TIMING MODULE

The BT-86 engine features an electronic ignition system. This system gradually delays the ignition timing according to the number of ignition pulses, increasing with the engine speed. The fuel mixture is ignited at almost top dead center when idling and the timing is gradually increased as the revolutions increase.

Manufactured by FUJI-IMVAC INC.
YOKOHAMA, 235-0005 JAPAN
Worldwide Distributor (except Japan): Hobbico, Inc.
Champaign, IL 61826 USA
www.fuji-imvac.com

Fuji-Imvac is not related to the original Fuji Engines sold by Mecoa.

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BEFORE OPERATION

1. Check to see that all screws and bolts are tight. Check carefully for any cracked, broken or missing parts. Tighten or replace before proceeding.

2. Do not operate engine in a closed room or where ventilation is not adequate.

3. Check to see that there are no foreign objects in the path of the propeller. Secure any loose articles of clothing so they cannot be drawn into the propeller.

4. Prepare only the amount of gasoline needed. Aged gasoline could damage the engine and cause it to overheat.

5. Mix gasoline with 2 cycle oil only in the ratio of 40 parts gasoline to 1 part oil (break-in ratio is 25 to 1.) Using fuel with an incorrect fuel/oil ratio or with oil not intended for 2 cycle engines could cause damage and allow the engine to overheat. Use an appropriate fuel filter to eliminate foreign matter.

6. Always allow engine to cool prior to refueling.

Break-in Operation
Operate engine for about one hour with a fuel mixture that contains a 25:1 fuel/oil ratio. Do not break in by opening the high-speed needle on the carburetor. Carbon will accumulate in the spark plug, which will make ignition difficult. (There is no problem if break-in is done by flying the engine.)

STARTING PROCEDURES

Manual Starting:
1. Make sure the ignition is OFF. Close the choke plate on the carburetor and open the throttle slightly from the idle position.

2. Rotate the propeller slowly about 10 to 20 times (more in Winter) until fuel begins to move to the carburetor. (Swing the prop one-half turn to move the piston from top dead center to bottom dead center, and then back to top dead center repeatedly. Opposite rotation can also prime the carburetor.)

3. Turn the ignition ON and flip the propeller several times briskly.

4. Turn the choke lever to the OPEN position after you hear an initial firing and the engine stops. You can squirt gasoline directly into the carburetor if the engine does not fire.

5. Rapidly flip the propeller until the engine starts. If the engine does not start, repeat the steps 1-4.
6. After starting, let the engine idle for two to three minutes. Open and close the

throttle until the engine runs smoothly at idle and at full throttle. Acceleration should also be smooth.

Safety Warnings:
For manual starting, make sure the propeller is properly adjusted on the propeller shaft to allow you to rotate the flywheel past the ignition coil at the highest possible speed during starting. Flip the prop rapidly from the point where you can first feel the compression.

Warning: Gasoline is volatile and flammable. Gasoline should be stored in an approved container, away from heat or open flames. Do not smoke near gasoline. Use caution when transporting gasoline and take precautions when fueling your engine.

Starting With Optional Spring Starter (FJIG1086)

1. With the ignition OFF, close the choke plate on the carburetor and open the throttle slightly from the idle position.

2. Rotate the propeller slowly about 10 to 20 times (more in Winter) until fuel begins to move to the carburetor. (Swing the prop one-half turn to move the piston from top dead center to bottom dead center, and then back to top dead center repeatedly. Opposite rotation can also prime the carburetor but will not be possible when using the spring starter.)

3. Turn the ignition ON. Hold the propeller, turn it clockwise 360° (one rotation) and let it go. Turn the choke lever to the OPEN position after you hear an initial firing and the engine stops. You can squirt gasoline directly into the carburetor if the engine does not fire. Repeat steps 1,2, & 3 above, as necessary.

Starting With Optional Electric Starter (Onboard type or External type)

1. With the ignition OFF, close the choke plate on the carburetor and open the throttle slightly from the idle position.

2. Turn the propeller with the starter for a few seconds until fuel begins to move to the carburetor.

3. Turn the ignition ON. Turn the propeller with the starter.

4. Turn the choke lever to the OPEN position after you hear an initial firing and the engine stops. You can squirt gasoline directly into the carburetor if the engine does not fire. Again, turn the propeller with the electric starter.

Starting Without Using the Choke (Recommended after the engine is well

broken-in.) Temperature: 60°F [15°C] or higher.

1. Set the throttle at idle.

2. Turn the ignition OFF.

3. Slowly turn the propeller by hand about 20 times (depending on the temperature).

4. Turn the ignition ON and rapidly flip the prop several times. (Repeat steps 1-3 above if the engine will not start.)

If the engine still does not start, check for the following:

1. Flooding: Rotate the propeller rapidly with the throttle fully opened.

2. If the engine is dry, you can put 5 to 6 drops of fuel directly into the carburetor opening.

If you can't tell whether the engine is flooded or dry, you can check by the following method:

1. Remove the spark plug. If the plug is wet with gasoline, the engine is flooded. Let the engine rest a few minutes, replace the spark plug and try starting again.

2. If the spark plug is dry, put 3 to 4 drops of fuel directly into the cylinder. Replace the plug and try starting again.

Ignition problems:

Remove the spark plug, but leave the ignition lead connected. Let the base of the plug contact the cylinder head. Rotate rapidly and check for a spark. The engine must turn at 500 rpm or more. Try it in dark room. A dirty plug will not spark. If there is no spark, replace or clean the plug. If the gap between the electrode and the center post is too large, there will be no spark. The gap should be about 0.030". Use a commercial spark plug gapping tool to check this.

We recommend that you use an electric starter until you get used to how this engine handles.

INSPECTION & ADJUSTMENT

Idle adjustment:

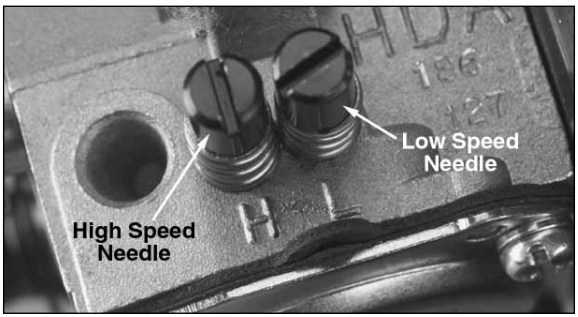
1. Always adjust idle with the engine shut off. Make sure the ignition is OFF.
2. Turn the idle adjust screw counterclockwise to lower the idle rpm. Turn the screw clockwise to increase the idle rpm. Turn the screw about 45° each time. (A too-low idle rpm causes the engine to stall.)
3. A dirty plug makes it difficult to adjust the idle rpm.

High and low-speed needle adjustment:

1. Always make high and low speed needle adjustments with the engine shut off. Make sure the ignition is OFF.
2. Adjust the needle marked “H” for high speed rpm. Adjust the needle marked “L” for low speed rpm. To lean the mixture, turn the needle clockwise. To richen the mixture, turn the needle counterclockwise.

Normal high and low-speed settings:

It is rarely necessary to change the needle settings. Normally, only the “H” needle will need adjustment from time to time, and only by a small amount. If the needles need to be reset, first close them by turning them gently clockwise until they stop. DO NOT tighten them. Just turn them until they stop.



H: Turn the needle counterclockwise 1-1/4 turns (±1/4 turn in Winter)
L: Turn the needle counterclockwise 1-3/4 turns (±1/4 turn in Winter)

The full-throttle mixture is adjusted with the “H” screw.

If the “H” needle is too lean, it may cause the following three symptoms.

1. Engine stops at full throttle.
2. Engine hesitates when accelerated rapidly.
3. The engine will not come up to full rpm at full throttle.

If the “H” needle is too rich, it may cause insufficient rpm at full throttle. This causes carbon buildup on the spark plug.

If the “L” needle is too lean, it may cause the following three symptoms:

1. The engine hesitates when accelerated rapidly.
2. The rpm increases at idling.
3. The engine stops when the throttle is moved from high to low.

If the “L” needle is too rich, the idle may be unstable.

The position of the “H” needle will vary according to air temperature and field elevation.

Spark plug:

The recommended plug to use is a Champion RCJ-6Y or 7Y. To avoid improper operation or possible engine damage, do not use other types of spark plugs. The plug gap is 0.025"-.030". If the plug gap is incorrect, adjust it with a spark plug gapping tool, wash it with gasoline, and allow it to dry well before you reinstall the plug in the engine. If the plug has become carbon-fouled, clean it with a spark plug brush, check the gap, clean it with gasoline, allow it to dry, and reinstall it.

Propeller:

Always use a well-balanced propeller.
Recommended propellers and their approximate rpm:

Bolly Carbon 24 x 10 (7500rpm)
Bolly Carbon 18 x 12 (6800rpm)

The rpm will vary according to temperature, atmospheric pressure, humidity, etc.

Test conditions:

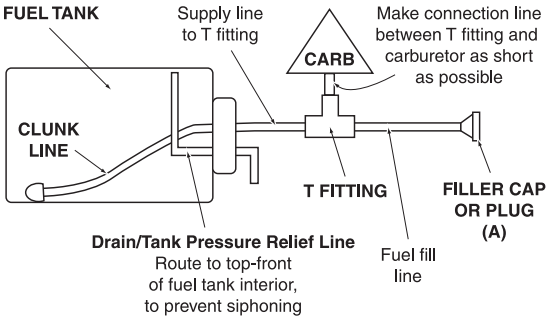
- Temperature 10C (50F)
- Humidity 40%
- New engine with 90 minutes break-in running
- No cowling, but with plastic spinner
- 40:1 standard gasoline/oil mixture

SAFETY WARNINGS

Always use lightweight spinner for ease in balancing. Using a thick metal spinner could cause the propeller shaft to break.

Do not use silicone fuel line because it will be attacked by the fuel. Use vinyl or neoprene rubber fuel line. Make sure the fuel line is well-secured to the metal tubes of the fuel tank so it won't come off in flight.

Keep the fuel line away from the cylinder head, especially in a cowling. The engine's heat can damage the fuel line.


FUEL TANK
Supply line to T fitting
CARB
Make connection line between T fitting and carburetor as short as possible
CLUNK LINE
T FITTING
FILLER CAP OR PLUG (A)
Drain/Tank Pressure Relief Line
Route to top-front of fuel tank interior, to prevent siphoning
Fuel fill line

After transporting your model, remove the air from the fuel line between the tank and the carburetor. The fuel line diagram shown above makes it easy to let the air out.

Drain fuel from A.

Always use oil intended for 2-cycle engines.

Use heat-resistant rubber or silicone hose to extend the exhaust outlet from the muffler. Metal tubing may cause the muffler retaining screws to loosen or cause damage to the cylinder. Muffler pressure to the fuel tank is not required.

If the engine will not be used for more than a month, drain the fuel tank, and remove any fuel from inside the carburetor. Do this by running the engine at idle until it quits by running out of fuel. Keeping gasoline inside the carburetor over an extended time will damage the diaphragm valve, and clog passages inside the carburetor.

Break-in:
Do not adjust the "H" screw. This engine should not be broken in the same way you would a glow engine. That would cause carbon to foul the plug and damage your engine.
The proper fuel/oil mixture ratio is 25:1.
Because the carburetor is more complicated than those used in glow engines, keep the fuel clean by using a fuel filter. Use a filter intended to be used with

gasoline engines. Filters intended for glow engines are too coarse, and will not screen out finer particles.

Always filter your fuel by using an appropriate filter before putting it into your storage container.

The shaft on the rear of the engine is used with an optional spring starter or an optional electric starter.

If the choke valve, in operation, touches the corner of the carburetor, bend the choke valve so it will operate freely.

The included engine mount is manufactured to be light in weight for model airplanes. Use a stronger engine mount if the engine is used on a test bench, or for any use other than on a model airplane. **Do not use the included engine mount with anything other than model airplane.**

Kill Switch
Your engine must have a kill switch installed. This is for practical as well as safety reasons. Your model will not comply with the AMA Safety Code unless it has a kill switch installed. We recommend the Great Planes® Manufacturing Gas Engine Ignition Kill Switch (GPMG2150).

Stopping the Engine
You can stop your engine by adjusting the idle stop screw to allow the carburetor to close past the normal idle position. This will choke the engine and it will quit.

3-Year Limited Warranty
For USA and Canada

Fuji-Imvac warrants this product to be free from defects in materials and workmanship for a period of three (3) years from the date of purchase. During that period, Fuji-Imvac will, at its option repair or replace without service charge any product deemed defective due to those causes. You will be required to provide proof of purchase date (receipt or invoice).
This warranty does not cover damage caused by crash, abuse, misuse, alteration or accident. Damage caused by customer disassembly, tampering, use of substandard fuel, use of incorrect accessories (spark plug, prop, etc.) or any use of the engine for which it is not specifically intended will automatically void the warranty of the engine. If there is damage resulting from these causes within the stated warranty period, Fuji-Imvac will, at its option, repair or replace it for a service charge not greater than 50% of the current retail list price. Be sure to include your daytime telephone number and e-mail address in case we need to contact you about your repair.
Under no circumstances will the purchaser be entitled to consequential or incidental damages. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.
If you attempt to disassemble or repair this unit yourself, it may void the warranty.

For service on your Fuji-Imvac product, either in or out of warranty, send it post paid and insured to:

Hobby Services
3002 N. Apollo Dr., Suite #1
Champaign, IL 61822 USA
(217) 398-0007
www.hobbyservices.com

Along with your engine and proof of purchase date, please include a complete written explanation detailing the problem(s). State your name and address clearly. For repairs not covered under warranty, you must specify whether you wish the charges to be billed COD or if you wish to be notified of the charges so you can send a check.

Outside USA and Canada, contact
local importer for warranty information.

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